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the sea into Byron Bay, near and south of Cape Harrison, that place will be equally satisfactory, all questions being considered; and from thence the cable can be carried into Hamilton Inlet, through one of the several channels connecting Byron Bay with the Inlet. Length of section about 510 miles.

Before the respective cables are laid, each of the places will be carefully sounded, and buoys will be placed indicating the deep trenches; and, besides, steam tenders will be in readiness to serve as pilots. Every precaution will be taken to obtain the most complete information with regard to the depths of the bays and of the sea.

The PRESIDENT.—The Society has heard, I have no doubt with much pleasure, the very interesting Papers that have been read this evening, and to afford an opportunity for a discussion upon them, their consideration will be continued at the next meeting.

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### ADDITIONAL NOTICE.

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#### *Additional Instrumental Instructions to Mr. Consul PETHERICK.*

By F. GALTON, Esq., Hon. Sec.

The observations that it is absolutely requisite you should make, are—

1. You are earnestly recommended to use every opportunity of practising with your sextants *upon stars* while on the Lower Nile, and able to check your results with known latitudes; also to practise observing eclipses and occultations under the same circumstances.
2. As a general rule, observations should be made at marked points, such as the confluence of rivers, prominent hills, and native towns, rather than at mere encampments.
3. Reliable latitudes of different places on the White Nile between Khartum and Gondokoro, and on your further line of travel. The latitude of Gondokoro is especially desired, and the meridian altitudes of at least six stars; three north and three south should there be observed.
4. Longitudes by the exceedingly simple methods of the eclipses of Jupiter's satellites, or of occultations of stars, to be made at Gondokoro and at the furthest point of your travel, or at places adjacent to these. The local time should there be determined by more than one set of observations, to guard against error, and the method of altitudes on both sides of the meridian should always be used. Any longitude south of the parallel of the Bahr el Ghazal would be very valuable.
5. The elevation above the sea of the following places by observation of the temperature of boiling water:—Cairo; Thebes; Assouan; Junction of Atbara; Khartum; the capital of the Shilluk country; the river at a point opposite the Bahr el Ghazal; Gondokoro, and different stations on your further route.
6. The three boiling-point thermometers to be occasionally compared, and to be carefully preserved, with the view of determining any changes in their index errors. They are also to be compared with those of Captain Speke, in

the event of the hoped-for meeting taking place between you and that gentleman.

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7. Simultaneous observations of the rise and fall of the Nile, at Gondokoro and Khartum, should be instituted, and also at as many other places as trustworthy observers may be found to make them.

8. It is of great geographical importance that the breadth, depth, and velocity of the Upper White Nile and its tributaries be ascertained, in order that their sections may be protracted, and the quantity of water that passes down them be determined. A few notes on practical methods of doing this will be prepared and given to you by Mr. George.

9. The compass bearing of marked hills should be frequently taken, and the position whence they are observed defined and laid down as unmistakeably as possible by cross bearing. Your course and estimated distances should be noted continuously day by day, and the variation of the compass frequently determined.

10. Time observations with your chronometer should be taken whenever latitude observations are made. These will serve to connect distant points whose longitude has been reliably determined by the rare occurrence of satellite eclipses and of occultations.

11. If any architectural monuments are met with, it would be important to take sketches and photographs of them, however rude; to make a general plan by measurement (for which a measuring-tape should be taken); and to note any peculiarities of construction or style, such as the use of the arch, the angles of the walls, doorways, and windows. If there be any inscriptions or hieroglyphs, they should be copied, or impressions taken of them, if possible, with coarse paper damped in water and pressed with a brush, upon the inscription. Any small objects of art or antiquity found amongst the natives should, if possible, be collected.

12. Every observation is to be copied from your rough notes into the Register-book which is supplied to you. Your entries, up to the last opportunity of communicating this winter with Khartum, to be forwarded from Gondokoro to the Secretary of the Royal Geographical Society.

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#### *List of Instruments and Books.*

2 sextants; 1 artificial horizon and spare mercury; 1 chronometer; 1 telescope and stand; 1 prismatic compass; 1 lantern; 1 hypsometrical apparatus attached to the lantern; 3 W.B. thermometers and 5 ordinary ones; Nautical Almanacks, 1861, 1862, and 1863; calculated list of those occultations and eclipses of satellites which may possibly be available; Raper's Tables; Manuals, viz. 'Hints to Travellers'; books of blank forms and register-books; 2 measuring tapes (50 feet and 100 feet).